dependent graph displays **110a/110b**.. The permanent copies may be pre-loaded into disk drive **522** in a factory, loaded from distribution medium **532**, or down loaded from a remote distribution source (not shown). Distribution medium **532** may be a tape, a CD, a DVD or other storage medium of the like. The constitutions of these elements are known. Any one of a number of implementations of these elements known in the art may be used to form computer system **500**. In alternate embodiments, other components may also be used in addition to or in lieu of the components described, e.g. additional processors. In selected ones of these multi-processor embodiments, execution of the programming instructions implementing CAD tool **100** incorporated with the teachings of the present invention may also be distributed among the processors.

REMARKS

Summary of the Office Action:

In the present application, claims 1-26 are pending and stand rejected.

Drawings:

In the Office Action, the drawings were acceptable for examination purposes only, and formal drawings will be required when the application is allowed.

Claim Objections:

Claims 5, 12, and 20 were objected to because of the following informalities: the term "selected ones of the design variables" is awkward. It was suggested by the Examiner that the phrase should read "selected design variables".

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

Respectfully Applicant disagrees with the proposed phraseology. Applicant respectfully asserts that to use "selected design variables" provides a potential antecedent basis issue. It is not clear from the phrase "selected design variables" if the reference is to a select set of the previously referenced designed variables or a new set of design variables. Applicant respectfully submits that in the context of the present claims, to use "selected design variables" would be to invite potential future invalidation of the claim under 35 U.S.C. §112.

Claim rejections under 35 U.S.C. §112, first paragraph

Remarks

Claims 1-21 and 23-26 were rejected under 35 U.S.C. §112, first paragraph.

Claim 1 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitations "***replicating a sub-graph***" and "***merging the replicated sub-graph...***" were not adequately discussed in the specification.

Following Applicant's response to the initial rejection, the Examiner states that the Applicant has not provided references in the specification to refute the Examiner's rejection. However, as stated in the first response, Examiner's initial rejection did not meet the initial burden and was, thus, inadequate. **Factors, reasons, and evidence** that lead the Examiner to conclude that the specification fails to teach how to make and use the claimed invention without undue experimentation should be explained. In

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

particular, **"specific technical reasons are always required."** MPEP §2164.04. Thus, a rejection based on a bald assertion that "[a] limitation is not adequately discussed in the specifications [sic]" is improper. Moreover, with respect to the Examiner's statement that "The arguments of counsel cannot take the place of evidence in the record.", absent specific technical reasons for a lack of enablement claim, Applicant is unsure of what evidence from the specification to proffer.

Thus, for at least the reasons set forth above, Applicant respectfully submits that the limitations of claim 1 is described in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Claim 2 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Examiner reasoned that the limitation "***identifying the sub-graph for replication***" was not adequately discussed in the specification. Specifically, the Examiner states that the cited page in the specification "does not enable one of ordinary skill in the art as to how to implement 'identifying the sub-graph for replication'".

Applicant respectfully submits the paragraph beginning on page 10, line 16 continuing through page 11, line 17 discloses how to identify the sub-graph for replication. If a portion of the design is selected, vis-à-vis a portion of the graph, then, the nodes directly associated with the selected portion of the design are determined (Fig

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

4, item **408**, page 10, lines 22-23). Note that if one has selected a portion of the graph instead of the design, implicitly one has already identified the directly associated nodes as these nodes are, by definition, selected. After having this set of directly associated nodes, the modeler determines the graph nodes dependant thereon by tracing the graph (Fig 4, item **410**, page 10 line 24 through page 11 line 1) identifying the directly and indirectly dependant nodes and arcs connecting them. Tracing techniques are used to systematically follow the linking arcs to the nodes upon which the directly associated nodes are dependant (page 11 lines 1 through 4).

Thus, for at least the reasons set forth above, limitations of claim 2 are presented in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Claims 2-21 and 23-26 recite similar limitations to claims 1 and 2 and were rejected under 35 U.S.C. § 112, first paragraph, under the same reasoning as claims 1 and 2. Accordingly, for at least the reasons set forth above with respect to claims 1 and 2, Applicant respectfully traverses the rejections for claim 2-21 and 23-26 under 35 U.S.C. §112, first paragraph.

Claim 24 was rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, Examiner reasoned that the limitation "a first and second processor communicatively coupled to each other to correspondingly

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

execute the first and second plurality of programming instructions" was not adequately discussed in the specification.

In response, Applicant respectfully traverses the Examiner's rejections. Applicant respectfully asserts that the limitations of "a first and second processor communicatively coupled to each other to correspondingly execute the first and second plurality of programming instructions" is adequately discussed to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. First, as previously discussed, Applicant respectfully asserts that the Examiner has not met the initial burden establishing a reasonable basis to question the enablement. Second, Examiner states that the arguments of counsel cannot take the place of evidence in the record. However, Applicant proffered the evidence that it is well known that as early as the 1980's a multi-processor super computer was developed by Cray, Inc. of Seattle, Washington, known as Cray X-MP™. In 1988, Cray Research introduced the Cray Y-MP®, the world's first supercomputer to sustain over 1 gigaflop on many applications. ***Multiple 333 MFLOPS processors*** powered the system to a record sustained speed of 2.3 gigaflops. See "Cray, Inc. History" at http://www.cray.com/company/history.html. For further reading on **multiprocessor** UNIX systems, see MAURICE J. BACH, THE DESIGN OF THE UNIX OPERATING SYSTEM, 391-411, 1986.

Thus, for at least the reasons set forth above, limitations of claim 24 are presented in the specification using languages and terminologies at a level that is consistent with the manner persons skilled in the relevant art present their works to one

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

another, thereby satisfying at least the enablement requirements of 35 U.S.C. §112, first paragraph.

Thus, for at least the reasons set forth above, claims 1-21 and 23-26 contain subject matter which was described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

37 C.F.R. §1.132 Declaration

As previously stated, Applicant respectfully disagrees with the Examiner's assertion that the above addressed claim limitations lack enablement under 35 U.S.C. §112 first paragraph. Nevertheless, it is well settled by the court that specifications with enough information to allow one ordinarily skilled in the art to practice the present invention without undue experimentation are deemed "enabling" in compliance with §112, first paragraph. Applicant respectfully submits that the limitations of claims 1-26 are described in the specification using language and terminology at a level that is consistent with the manner persons skilled in the relevant art present their work. Consequently, others skilled in the art, upon reading the specification, will be able to practice the invention described, including the above mentioned limitations rejected under 35 U.S.C. §112, first paragraph, without undo experimentation. Applicant respectfully submits that more detailed disclosure is unnecessary for one ordinarily skilled in the art to practice the present invention without undue experimentation. In support of Applicant's position, Applicant encloses herewith a declaration by Mark Lambert, a person ordinarily skilled in the art, attesting to the fact that he is able to practice the present invention without further experimentation. In light of the forgoing,

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

Applicant respectfully submits that claims 1-26 comply with 35 U.S.C. § 112, first paragraph.

Claims rejections under 35 U.S.C. §102 and Response:

Ansaldi

Claims 1-7 and 25-26 were rejected under 35 U.S.C. §102(b) as being anticipated by *Ansaldi.* In response, Applicant respectfully traverses the Examiner's rejection.

Claims 1, 25, and 26, in part, recite the limitations of **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

In detail, the Examiner has cited page 139 column 1 lines 9-20 and Figure 2(d) in regards to replicating and merging a sub-graph. Figure 2(d), however, as discussed in the last paragraph of page 133, column 2, discusses joining two faces belonging **to two different shells** *s* and *s'*. That is, shell *s* and shell *s'* are different shells. Thus, there is no discussion of replicating a sub-graph from a dependant graph of a first mechanical design of a computer aided design (CAD) tool. Additionally, lines 9-20 in column 1 of page 139 do not provide further insight. Lines 9-16 discuss the fact that every shell of an object is represented by a different component in its face adjacency graph and that the decomposition of the face adjacency graph allows for recognition of special

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

topological features. Lines 16-20 suggest that the face adjacency graph has been demonstrated to be a valid model in practical applications. This section says nothing with respect to replicating a sub-graph from a first dependant graph nor does it says anything with respect to merging a replicated sub-graph into a second mechanical design. Thus, Applicant respectfully submit that *Ansaldi* does not disclose or suggest **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design.**

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Ansaldi*, and each of the independent claims 1, 25, and 26 is patentable over *Ansaldi*.

Claims 2-7 depend from independent claim 1 incorporating its limitations. Thus, by virtue of at least their dependency on claim 1, claims 2-7 are patentable over *Ansaldi*. In addition, claims 2-7 include numerous limitations that render these claims further patentable over *Ansaldi*.

Zeid

Claims 1-2 and 25-26 were rejected under 35 U.S.C. §102(b) as being anticipated by *Zeid*. In response, Applicant respectfully traverses the Examiner's rejection.

Claims 1, 25, and 26, in part, recite the limitations of **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided**

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

design (CAD) tool or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**, as claimed in the present invention.

Zeid is cited at 392-393 for teaching **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool**. *Zeid* however discloses a Constructive Solid Geometry (CSG) graph. A CSG graph is a symbolic representation of, and is intimately related to, the modeling steps used by the user to create a model. Thus, the CSG is useful in creating a typical solid as shown in Figure 7-41 by **graphically representing *the process*** by which primitives of a solid are combined to make the solid. *Zeid* does not suggest or disclose **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool.**

Thus, for at least the reasons set forth above, the present invention is not anticipated by *Zeid*, and each of the independent claims 1, 25, and 26 is patentable over *Zeid*.

Claim 2 depends from independent claim 1 incorporating its limitations. Thus, by virtue of at least its dependency on claim 1, claim 2 is patentable over *Zeid*. In addition, claim 2 includes other limitations that render this claim further patentable over *Zeid*.

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

Claim rejections under 35 U.S.C. §103(a) and Response:

Ansaldi

Claims 8-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Ansaldi*. In response, Applicant respectfully traverses the Examiner's rejections.

As part of the basis for the Examiner's rejection of claim 8, the Examiner relies upon the previous argument that *Ansaldi* teaches the creation and merging of graphs and sub-graphs as described in claim 8. The Examiner additionally takes Official Notice that "it would have been obvious and well known to one of ordinary skill in the art to utilize a recordable medium ...".

However, as discussed above, Applicant respectfully submits that *Ansaldi* does not teach **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**. Thus, *Ansaldi* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a recordable medium, claim 8 is nevertheless not obvious over *Ansaldi* as the basic elements upon which the rejection is based are not taught by *Ansaldi*. Thus, for at least the reasons set forth above, independent claim 8 is patentable over *Ansaldi*.

Claims 9-15 depend from claim 8 incorporating its limitations. Thus, by virtue of at least their dependency on claim 8, claims 9-15 are patentable over *Ansaldi*. In

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

addition, claims 9-15 include numerous other limitations that render these claims further patentable over *Ansaldi*.

Claims 16-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Ansaldi*. In response, Applicant respectfully traverses the Examiner's rejections.

As part of the basis for the Examiner's rejection of claim 16, the Examiner relies upon the previous argument that *Ansaldi* teaches the creation and merging of graphs and sub-graphs as described in claim 16. The Examiner additionally takes Official Notice that "it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium ...".

However, as discussed above, Applicant respectfully submits that *Ansaldi* does not teach **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**. Thus, *Ansaldi* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage medium, claim 16 is nevertheless not obvious over *Ansaldi* as the basic elements upon which the rejection is based are not taught by *Ansaldi*. Thus, for at least the reasons set forth above, independent claim 16 is patentable over *Ansaldi*.

Claims 17-24 depend from claim 16 incorporating its limitations. Thus, by virtue of at least their dependency on claim 16, claims 17-24 are patentable over *Ansaldi*. In

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

addition, claims 17-24 include numerous other limitations that render these claims further patentable over *Ansaldi*.

Zeid

Claims 8 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Zeid* in view of Official Notice. In response, Applicant respectfully traverses the Examiner's rejections.

As part of the basis for the Examiner's rejection of claims 8 and 16, the Examiner relies upon the previous argument that *Zeid* teaches the creation and merging of graphs and sub-graphs as described in claims 8 and 16. The Examiner additionally takes Official Notice that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium.

However, as discussed above, Applicant respectfully submits that *Zeid* does not teach **replicating a sub-graph from a first dependent graph of a first mechanical design of a computer aided design (CAD) tool** or the **merging the replicated sub-graph into a second dependent graph of a second mechanical design of the CAD tool to reuse the subpart of the first mechanical design in the second mechanical design**. Thus, *Zeid* does not teach the basic elements upon which the 35 U.S.C. §103(a) rejection is based. Assuming, arguendo, that it would have been obvious and well known to one of ordinary skill in the art to utilize a storage/recordable medium, claims 8 and 16 are nevertheless not obvious over *Zeid* as the basic elements upon which the rejections are based are not taught by *Zeid*. Thus, for at least the reasons set forth above, claims 8 and 16 are patentable over *Zeid*.

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

Conclusion:

In view of the forgoing, Applicant respectfully submits that all claim 1-26 are in condition for allowance. Early issuance of the Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393. A Fee Transmittal is enclosed in duplicate for fee processing purposes.

Respectfully submitted,
Schwabe, Williamson & Wyatt, P.C.

Dated: 21 Jan, 2003

Robert Watt
Registration No. 45,890

10260 SW Greenburg Road, Suite 820
Portland, Oregon 97223
Telephone: 503-595-2800

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at page 1, line 14 has been amended as follows:

Prior art CAD tools typically describe a mechanical design in terms of various geometric shapes, also referred to as "parts". Each part in turn is expressed as a step-by-step recipe incrementally building the various features of the geometric shape, with each step roughly correspondings to a feature. In other words, each part is formed through a linear sequence of steps. For example, a linear step sequence may specify a particular geometric shape is to be formed by starting with a block, cutting a slot at a first location (a first feature), then cutting another angled slot at a second location (a second feature), and so forth. By changing the different design parameters of the "recipe", different embodiments of the geometric shape may be built.

Paragraph beginning at page 4, line 10 has been amended as follows:

Figure 3 illustrates the method of the present invention for viewing a mechanical design and its dependent graph in accordance with one embodiment;

Paragraph beginning at page 6, line 4 has been amended as follows:

Referring now to **Figure 1**, wherein a block diagram illustrating an overview of the present invention in accordance with one embodiment is shown. As illustrated, CAD tool **100** includes modeler **102** and browser **104**. As in prior art, modeler **102** models mechanical designs (hereinafter, simply designs), while browser **104** facilitates display of the modeled designs and related information for the designer,

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

as well as facilitates input by the designer. However, unlike prior art, in accordance with the present invention, modeler **102** models designs employing dependent graphs, and using data **106a-106b** suitably organized for the dependent graph approach, to be described more fully below, whereas browser **104** not only facilitates display of the designs **108a-108b** and their dependant graphs **110a-110b**, but facilitates their displays in a novel coordinated manner. As will be readily apparent from the description to follow, the present invention advantageously enables a designer to be able to efficiently reuse subparts of one design in another design. In particular, the present invention advantageously enables a designer to be able to efficiently explore the interrelationship between various subparts of a modeled design and its dependant ~~para~~graph, thereby allowing the designer to efficiently leverage on the reuse support offered by CAD tool **100**.

Paragraph beginning at page 7, line 2 has been amended as follows:

Refer~~ring~~ now to **Figures 2a-2c**, wherein three diagrams illustrating the relationship between an example modeled design, its data and dependent graph, in accordance with one embodiment, are shown. As illustrated in **Fig. 2a**, example design **200** is a simple rectangle having four sides A through D. **Fig. ~~2b~~2c**, illustrates example dependent graph **202** employed by modeler **102** to model design **200**. As illustrated, example dependent graph **202** includes nodes **204**, nodes **206**, and arcs **208** linking nodes **204** and **206** to one another. Nodes **204** and **206** represent "atomic" design variables of example design **200**, i.e. they represent the "lowest level" information building blocks for modeling example design **200**. Examples of these "lowest level"

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

information building blocks are numbers, lines, points, and so forth. Nodes **204** are referred to as independent nodes representing independent design variables, whereas nodes **206** are referred to as dependent nodes representing dependent design variables. Dependent design variables are those design variables that cannot be resolved until other design variables are resolved first. Thus, arcs **208** represent dependencies between the design variables represented by nodes **204** and **206**. For examples, nodes **206** directly representing lines A-D of rectangle **200** are linked to nodes **204** defining lines A-D's dimension, as well as to one another, by arcs **208** representing the "length of", perpendicular, and parallel relationships between these nodes. Two example types of "dimension" nodes **204** are illustrated, "3 cm" and "<user input>". Nodes **206** linked to "3 cm" node **204** represent the length of the lines represented by the particular nodes **206** are invariantly assigned the value "3 cm", whereas nodes **206** linked to "<user input>" node **204** " represent the length of the lines represented by the particular nodes **206** are eligible to have their lengths variably assigned by the designer.

Paragraph beginning at page 8, line 2 has been amended as follows:

As shown in **Fig. ~~2c~~2b**, for the illustrated embodiment, the descriptive data of example design **200** processed by modeler **102** to generate dependent graph **202** are organized in a tabular manner. As those skilled in the art will appreciate that any one of a number of other known data organizations may also be employed to store the descriptive data of a design.

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

Paragraph beginning at page 8, line 14 has been amended as follows:

Refer~~ring~~ now to **Figure 3**, wherein a flow diagram illustrating the operational flow of browser **104** for facilitating exploration of a modeled design and its dependent graph, in accordance with one embodiment, is shown. As illustrated, at **302**, browser **104** receives certain selection inputs from the user. The selection may be denoted and communicated to browser **104** in any one of a number of techniques known in the art, e.g. using a cursor control device and posting messages for browser **104** responsive to certain predetermined cursor control device events. In response, at **304**, browser **104** determines whether the selections were made in reference to the design displayed **108a/108b** or in reference to their dependent graphs **110a/110b**. The determination may also be made in accordance with any one of a number of techniques known in the art, e.g. by having the messages include identification information of the "focus" window at the time the cursor control device events arose.

Paragraph beginning at page 9, line 13 has been amended as follows:

Similarly, If it is determined at **304** that the selections were made in reference to the dependent graph displayed **110a/110b**, at **312**, browser **104** determines whether the graphical elements selected are directly associated with specific subparts of the mechanical design. If the graphical elements selected are not directly associated with specific subpart of the mechanical design, at **314**, browser **104** follows the arcs radiating from the selected graphical elements to identify the "nearest" directly associated nodes. Upon either having received identifications of the directly

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]

associated nodes directly, or determined the directly associated nodes, at **316**, browser **104** refreshes design display **108a/108b** to highlight the directly associated subparts.

Paragraph beginning at page 13, line 6 has been amended as follows:

The elements perform their conventional functions known in the art, except CAD tool **100** which performs its otherwise conventional functions in accordance with the present invention. In particular, disk drive **522** and system memory **514** are used to store permanent and working copies of CAD tool **100** and operating system **550**, and video display **518** is used to display e.g. design displays **108a/108b** and dependent graph displays **110a/110b**.. The permanent copies may be pre-loaded into disk drive **522** in a factory, loaded from distribution medium **532**, or down loaded from a remote distribution source (not shown). Distribution medium **532** may be a tape, a CD, a DVD or other storage medium of the like. The constitutions of these elements are known. Any one of a number of implementations of these elements known in the art may be used to form computer system **500**. In alternate embodiments, other components may also be used in addition to or in lieu of the components described, e.g. additional processors. In selected ones of these multi-processor embodiments, execution of the programming instructions implementing CAD tool **100** incorporated with the teachings of the present invention may also be distributed among the processors.

Received from < 5035952804 > at 1/21/03 7:21:03 PM [Eastern Standard Time]